

HEAT TREATMENT OF RENE 95 DIE INSERTS

ABSTRACT OF THE DISCLOSURE

[0025] A rigid die insert for forming and shaping a working material. The rigid die insert comprises a nickel-base superalloy, preferably Rene 95. A plurality of gamma prime particles are uniformly distributed throughout the rigid die insert, which has a Rockwell hardness Rc of between about 48 and about 52. The invention also includes a method of treating a rigid die insert comprising a nickel-base superalloy to reduce crack propagation and raise yield stress. The method comprises the steps of: providing the rigid die insert; dissolving larger gamma-prime particles in the rigid die insert; and growing additional gamma-prime particles of smaller particle size in the rigid die insert, whereby the particle size of each of the plurality of gamma-prime particles is refined, thereby reducing crack propagation and raising the yield stress of the rigid die insert. A method of refining the particle size of gamma-prime particles in a Rene 95 superalloy is also disclosed.